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Investigation of Regulating and Limiting Factors in the Delta Caribou Herd

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Research Performance Report
1 July 2000–30 June 2001
Federal Aid in Wildlife Restoration
Grant W-27-4, Project 3.42

This is a progress report on continuing research. Information may be refined at a later date.

ALASKA DEPARTMENT OF FISH AND GAME
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PROJECT TITLE: Investigation of regulating and limiting factors in the Delta Caribou Herd

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GRANT AND SEGMENT NR.: W-27-4

PROJECT NR.: 3.42

SEGMENT PERIOD: 1 July 2000–30 June 2001

STATE: Alaska

WORK LOCATION: Unit 20A

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE: Evaluate the influence of weather, density, food limitation, hunting, and predation on the population dynamics of the DCH (Delta Caribou Herd).

Data collected during annual photo censuses indicated the DCH has declined during the past 5 years. Estimated herd size been 4646, 4019, 3699, 3829, 3227, and 2755, respectively, for each year from 1996 thru 2001. Although adult mortality was relatively low during this period, the herd may have declined due to high mortality of calves through 16 months of age.

Data on bull:cow ratios are variable among years, depending on timing of fall counts, late summer distribution of bulls, and behavior of bulls. However, the bull:cow ratio has increased since the mid-1990s and the herd can sustain a small bulls-only hunt.

Natality of females (3 years old and older) in the DCH has been variable since the initiation of this project, ranging between 71% in 2001 and 89% in 1999. Two-year-olds rarely produce calves in the DCH; the rate has ranged between 0 and 14% during 1996 to 2001.

Weight of newborn calves from the DCH has averaged 8.13 kg since 1996. Weights of newborn females tended to be less than those of males. Weight and condition of 4-month-old and 10-month-old Delta calves have not returned to levels in the early 1980s when herd

size was low, and calves have commonly lost weight over winter since 4-month-old calves were first weighed in 1991.

Mortality of female calves (4–16 mo of age) has been approximately 40% since 1996. Mortality of female yearlings (16–30 mo of age) has been approximately 8%. Mortality of caribou older than yearlings has been approximately 11%.

Since 1996, DCH caribou have typically spent summers on their normal summer ranges on the Gold King Benches, Iowa Ridge, upper Buchanan Creek, and upper Tatlanika/Moose Creek. During rut many caribou move to the upper Wood River and Dick Creek. During this period caribou from the DCH have been wintering in the lower Yanert River and upper Nenena Drainage in Unit 13. Significant numbers of caribou have also wintered in the drainages of the Little Delta River, Delta Creek, and near Donnelly Dome. As winter progressed, many caribou moved north to the Totatlanika River and surrounding drainages. Calving occurred south of the Alaska Range as far south as the Denali Highway and east to the East Fork Susitna River.

A limited permit-drawing hunt was reopened in the DCH in 1996 and 22 bulls were taken. In 1997, 44 bulls were reported harvested, and 49 bulls and 1 cow were reported taken in 1998. In 1999 and 2000, 38 and 24 bulls were reported taken, respectively. In summer 2000, 50–60 bulls were seen near Donnelly Dome. These caribou most likely were Delta caribou, and some may have been taken in the Macomb hunt in mid-September 2000.

We continued to collect winter fecal pellets from selected herds including the DCH. Currently, samples are at labs and we are awaiting analysis.

Genetic distance comparisons and assignment tests indicate 5 or 6 Interior Alaskan caribou herds tested (i.e., Nelchina, Mentasta, Macomb, Fortymile, and Porcupine) are relatively closely related (Tables 7 and 8). The Chisana Herd, however, is very different from other Interior herds and seems to be most closely related to Yukon "woodland" or "mountain" caribou herds that also appear to be very different from each other (Strobeck et al., in press). In contrast, 4 of 5 herds tested in southwestern Alaska seem quite different from each other. As expected, Nushagak Peninsula and NAP caribou were similar, and in the assignment test, more Nushagak caribou were assigned to the NAP than any other herd (including the Nushagak). The Nushagak Herd arose from a transplant from the NAP in 1988.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Census.

The 2001 census of the DCH began on June 27 of this reporting period and was completed on July 10. We used 7 fixed wing flights to complete the census.

JOB 4: Fall and spring composition counts.

We used an R-22 helicopter to observe 1010 caribou from the DCH in fall 2000 during 2 days of composition counts. No composition counts were flown in spring 2001.

JOB 7: Determine weight and size of calves in spring and fall.

We captured 14 calves during fall 2000 and 13 calves in spring 2001. Both the spring and the fall captures each required 2 days of flying in an R-22 helicopter and a fixed-wing aircraft. All calves were weighed, measured, and radiocollared. In addition, 3 yearlings were captured incidentally and were also sampled and radiocollared.

JOB 8: Food habits of Interior herds.

During this reporting period we collected fecal samples from different portions of the DCH winter range in conjunction with weight determination of calves (April) and recollaring of adults (Job 7).

JOBS 2,3: Determine natality rate and timing of calving.

To determine natality rate and timing of calving, we conducted 3 days of fixed-wing aircraft flying during spring 2001.

JOB 6: Monitor movements and dispersal and timing and causes of mortality of adults and calves older than 3 weeks.

During this reporting period we flew 5 fixed-wing radiotracking flights to monitor movements, dispersal, timing, and causes of mortality. Each of these flights took 2 days to complete. In addition, a helicopter (R22) was used for the retrieval and investigation of 8 mortalities.

JOB 7: Recollar adult caribou.

Recollaring of adult caribou was completed in conjunction with fall and spring capture of calves. During this reporting period we recollared 4 adults during fall and 3 adults during spring.

JOB 9: Reviewing literature, preparing reports and papers for publication.

During this reporting period we submitted 3 manuscripts for publication in *Rangifer*. The submittals are currently in press. We submitted the July 1999–June 2000 Research Progress report for this study (3.42). We also submitted the 2001, 5-year Wildlife Research Study Plan for the continuation of this project. In addition, data collected from this project is used in Unit 20A moose management reports and advisory committee meetings.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

No additional Federal Aid funded work was accomplished during this period.

IV. RECOMMENDATIONS FOR THIS PROJECT

The main thrust of this research project is to determine which factors are most important in driving caribou population fluctuations. The current working hypothesis is that population fluctuations are primarily caused by the interaction of population density (i.e., food shortage), weather, and predation. Data collected over the last few years are consistent with this hypothesis and indicative of both winter and summer food shortages.

We recently extended work on the Northern Alaska Peninsula during a period of rapid population decline. The population decline seems to have ultimately been caused by overpopulation that resulted in overused winter range, reduced body size and condition, lower natality, and increased mortality from causes other than predation (e.g., disease) in the herd.

During the last 5 years we have been collecting caribou to improve techniques for monitoring body condition. Data indicate that in most cases live body weight provides an adequate measure of condition and is well correlated with femur marrow fat and the amount of fat in other depots. We have therefore decided to suspend the collecting program, except in Southwest Alaska where we will continue to periodically monitor caribou for pneumonia.

V. PUBLICATIONS

Three manuscripts were submitted to *Rangifer* and are in press.

VI. FEDERAL AID TOTAL PROJECT COSTS FOR THIS SEGMENT PERIOD

Total Federal Aid project costs during this period were $64,000, including all personnel and operating costs.

VII. PREPARED BY:

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